

## **A Collaborative Project Exploring Open Educational Resources and Virtual Reality**

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### **Abstract**

The purpose of this collaborative project is to incorporate Open Educational Resources (OER) and Virtual Reality (VR) into college courses to promote student engagement and flexible learning opportunities. This project will assist teachers in the K-12 and higher education environment to better identify lesson strategies for the implementation of OER and VR. This collaborative partnership primarily focuses on the experiences of two assistant professors in the School of Education at different universities and their encounters thus far in the study with the integration of the two resources. Though the use of OER and VR are not connected, two assistant professors work as a team during workshops, consulting, and staff developments. The two explore various emerging technologies and other resources and share their experiences with K-12 and higher education instructors in the field. The two assistant professors teach literacy and instructional technology pedagogy at their institutions. Throughout this project, faculty and teacher candidates participate in lessons, assignments, and projects that incorporate the use of OER and VR. The researchers of this project strive to integrate active learning and student-centered experiences into lessons. As mentioned, the partnership hopes to glean the following outcomes from the study: enhanced student engagement and achievement and increased personalized and cooperative learning opportunities. The results will be shared after formal surveys are disseminated to students over the span of two semesters at each university. To better validate this research, from 2016-2019 formal studies are being conducted at each university. Therefore, additional data is currently being collected.

### **VR and Classroom Instruction**

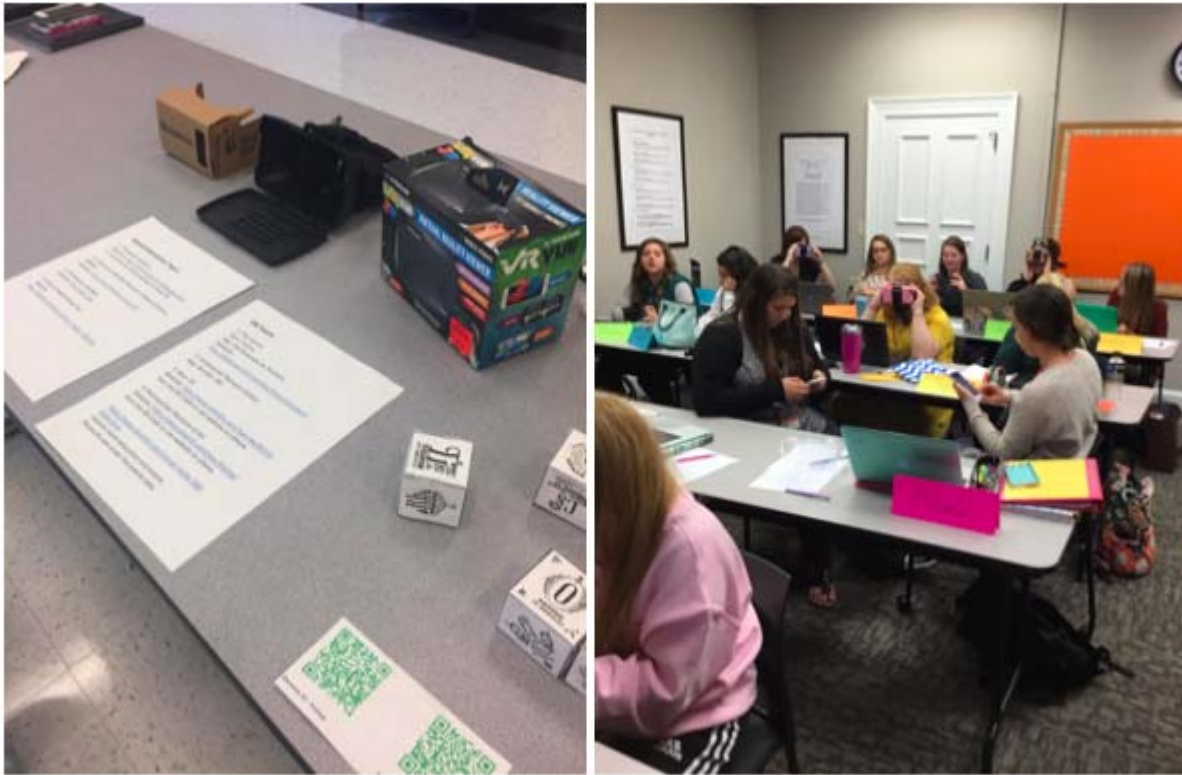
Virtual reality provides an avenue for teachers to deliver standards-based curriculum to today's tech-savvy digital learners (Tiala, 2006). According to a 2017 survey of more than 500,000 teachers, students, school administrators, and parents revealed that augmented reality applications and virtual

reality experiences might be the stimulation students need. The survey was part of the 2016 Speak Up Survey from Project Tomorrow. Results from the study revealed that 33 percent of middle school students and 26 percent of high school students chose augmented reality as part of their “ultimate school.” In the study, only 12 percent of parents and administrators and 13 percent of teachers shared the same enthusiasm. In a similar 2017 study of over 8,000 teachers and media specialist, 48 percent of teachers used game-based environments, and 42 percent used G Suite for Educators, while only 6 percent used augmented and virtual reality combined (Nagel, 2017). Though Project Tomorrow calls augmented and virtual reality two of the “hottest rising stars” in technology, there is a definite gap between how kids and adults view these technologies (Nagel, 2017). Virtual reality provides a controlled environment like a classroom where students have the opportunity to test a range of theories in a way that is realistic and naturalistic. At the same time, virtual environments allow for a high sense of awareness and concern for surroundings and observations (Won, 2016).

### **Experiences with VR**

Lecture-style teaching has become a strategy of the past and can sometimes pose a problem for millennial learners. Throughout years of teaching, the researcher of this proposal has found that some of the most challenging instructional tasks for teachers are engaging students, differentiation, and attending to the needs of multiple learning styles. Exploration with VR in the classroom began in the fall of 2016, after attending a captivating workshop during the summer. Though VR had been experienced in the past on a personal level, VR had not been considered VR as an instructional strategy. After the workshop, a decision was made to incorporate the use of VR goggles into specific technology classes to include, Educational Foundations of Technology (a course taught to undergraduate teacher candidates the semester before student teaching). VR could serve as an exciting resource to integrate into daily lessons once candidates were student teaching. Therefore, the plan was not only to increase engagement for teacher candidates, but for the learning strategy to extend to K-12 students. Teacher candidates were required to incorporate the use of VR into their syllabi and daily lessons. According to Tiala, VR can easily be integrated into teaching concepts as higher education instructors and K-12 teachers can incorporate interactive, three-dimensional, computer images, and stereographic computer images (Tiala, 2006).

The materials needed are a pair of VR goggles (headsets or glasses), a smartphone, and an app or video. The instructor experimented with virtual tours, 3-D graphics, and videos. Lessons mainly focused on how to integrate the use of VR into curricula, but not on any particular content because the class was comprised of students majoring in elementary, middle, or secondary education. Classes practiced with Google Expeditions, Youtube videos, and interactive apps (see Figure 1).



*Figure 1. VR in the Classroom.*

There are many platforms for VR, such as Oculus RIFT, Samsung Gear VR, and Google Cardboard. Before submitting a request to purchase VR goggles the instructor explored with three different headsets: 1. Google Cardboard - \$15.00, 2. Sykro VR - \$70.00, and 3. VR Text - \$150.00 (these are approximate costs). To get started, set of Google Cardboards were borrowed from a STEM class at a neighboring middle school. From the researcher's perspective, neither of the sets had a much of an advantage over the other in regards to clarity of pictures, graphics, or videos. After research and practice on the subject of VR for instructional purposes, twenty-five sets of VR Vue were purchased at \$10.00 each.

After much exploration with YouTube videos and VR applications, Google Expeditions was favored over GoProVR, Public Speaking VR, and Inside Abbey Road. Google Expeditions is a VR instructional tool that allows the teacher to lead in an expedition in most content areas and at the same time students can join the expeditions (Google Expeditions, 2018). These immersive expeditions can take students from the Taj Mahal to the depths of the ocean.

The instructor integrated VR into many lessons, during one particular class project, after discussing with students how to teach across the curriculum, the use of VR was integrated into a two-part social studies and writing lesson. In the first part of the lesson, teacher candidates participated in a traditional style lesson where they were required to use the Internet as a resource to research the major landmarks in countries around the world. The instructor was not specific about which websites to use. Students were to write a one-page essay about what they found in each country and share out their findings through presentations. The list included: African countries, China, Germany, Japan, United Kingdom, and the United States. In the second part of the lesson, students completed the same lesson except with

VR goggles and the use of the Expeditions app. Again, students wrote about their findings and shared their essay presentations. Each lesson experience provided students with images, videos, and facts. However, the VR experience generated more conversation among the students. There was an increase in excitement, engagement, and an increase in the number of groups that volunteered to share their presentations. An informal survey was conducted, and students overwhelmingly shared that they preferred the VR experience over the assignment without VR.

Throughout semesters teacher candidates were required to practice writing lesson plans that include the use of VR. During student teaching the candidates can execute their lessons. Student teachers that are placed at schools without VR goggles are allowed to sign-out headsets from the education department or the university's Curriculum Materials and Media Center. Most of the K-12 schools served have access to iPods for students that do not have Smartphones. Thus far, science candidates have written VR lessons with objectives that include biomes. This allows K-12 students who have never experienced a biome except for on the pages of a book or on a video to feel that they are outside in nature experiencing an actual biome. Other science candidates have created lessons on space objectives which allows for their students to travel to the moon and back without ever leaving the classroom. Social studies teacher candidates have integrated VR into their lesson plans through virtual field trips. Candidates who teach math designed lesson plans that helped K-12 students better understand geometry. Additionally, the researcher shares with psychology instructors how VR can be used concerning patients with different phobias. To gather additional data, the researcher conducts staff developments and workshops on the use of VR in the classroom and gathers feedback from teachers for a future study.

## **Implementation of OER**

Another trending and rising star in education are OER. In a study conducted by Vojtech, Gabrielle; Grissett, Judy (2017) college students expressed that they would instead use OER in place of the traditional text due to the creativity of the course. In the same study, students reiterated that the cost was indeed a benefit as they were not expected to purchase a text when using OER. It is important to note that in a study conducted at eight colleges across the United States it was found that both teachers and students rated OER to be at least equal in quality to traditional texts (Bliss, Robinson, Hilton, Wiley, 2013).

A significant concern of instructors is the ease of use with implementing new technologies and software into classroom practices. The particular READ course used for the incorporation of OER was taken by education candidates pursuing a concentration in reading. Intellus Learning is an OER platform which was designed to assist faculty with reviewing and discovering the use of digital resources to integrate into classes. Intellus is similar to other OER platforms such as OER Commons, OpenStax, Open Textbook Library, and MERLOT. Intellus Learning enables instructors to track student activity and accelerate student engagement and course development. Additionally, Intellus Learning was designed to reduce the cost of materials for students (Marketwired, 2015). The OER chosen from Intellus Learning worked smoothly with the institution's learning management system (LMS), as the instructor was able to embed resources into course modules in Canvas. Also, Intellus Learning enables instructors to produce a syllabus through their platform, which allows students to click on links which directly navigate them to the OER for that particular module (see Figure 2).

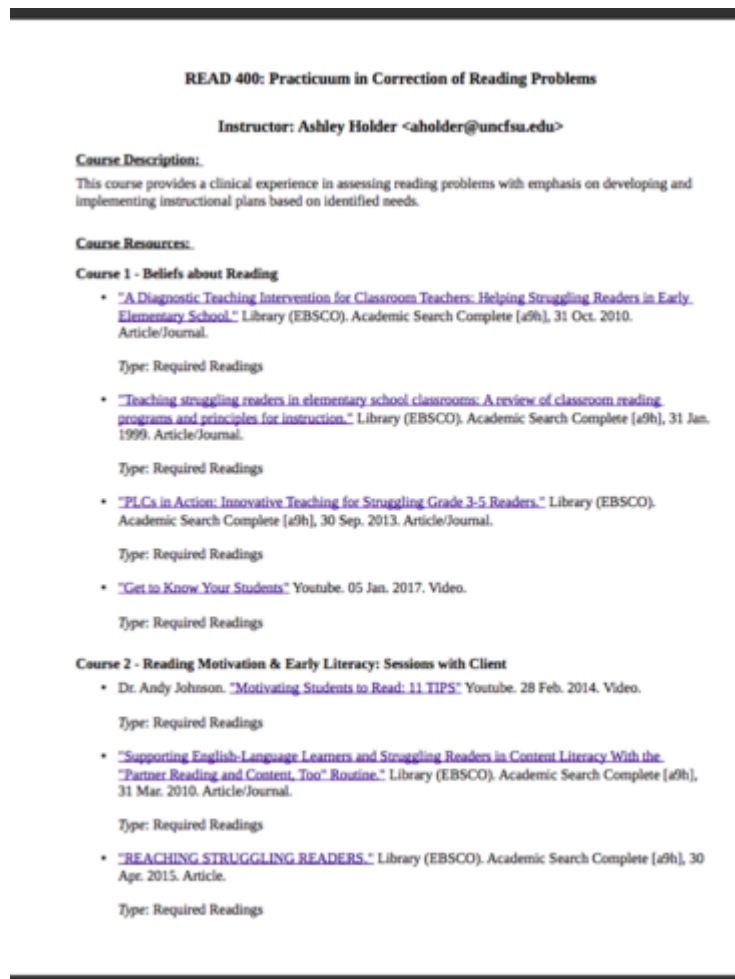


Figure 2. Screenshot of Intellus Syllabus with clickable links.

Intellus Learning helps instructors access high-quality resources quickly through the “Explore” database. The search capability allows faculty to narrow the search to precisely the type of resource they wish to embed in their curricula. For example, instructors have the choice to choose date of publication, source (EBSCO, Pearson, Youtube, TED talk, videolectures.net, wisc-online, article, etc.) and type (article/journal, assignment, case study, assessment, audio, data, eBook, flashcards, exam, games, interactive tutorial, lecture notes, lesson plans, podcast, video, web page, etc.) See Figure 3.

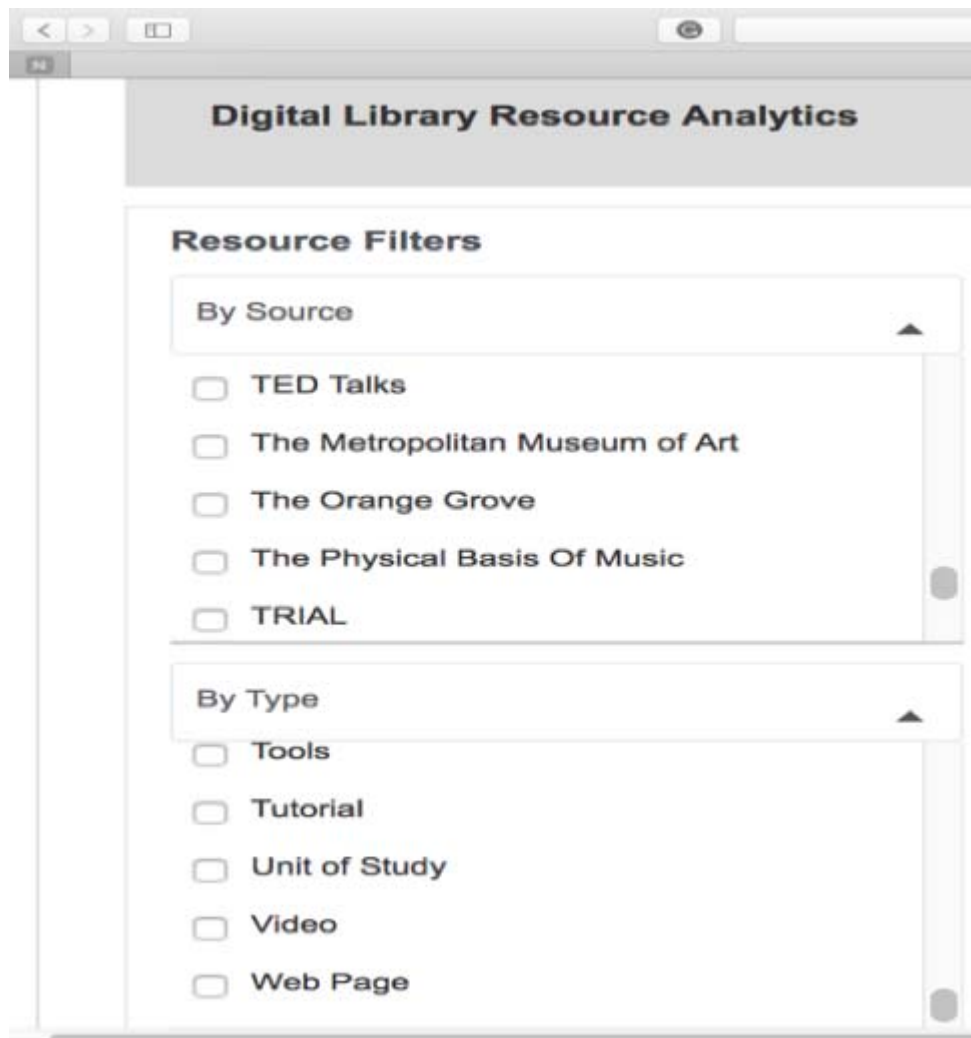


Figure 3. Screenshot of “Explore” feature in Intellus Learning.

### OER and Classroom Instruction

Teacher candidates were able to engage with multiple OER throughout semesters. When learning about the importance of relationship building and motivating students to become lifelong readers, students viewed TEDx Talks and other videos to understand better the link between building relationships and student reading success. This allowed the instructor to relate to the many different cultural backgrounds of the students. For reference, the OER sources are listed below which were pulled from Intellus Learning to drive this learning outcome:

- "Get to Know Your Students" Youtube. 05 Jan. 2017. Video.
- Dr. Andy Johnson. "Motivating Students to Read: 11 TIPS" Youtube. 28 Feb. 2014. Video.

The researcher teaches literacy courses for elementary education majors. Therefore, there is a significant focus on terminology which prepares teacher candidates to become effective teachers of reading through their knowledge of the five pillars of reading. Additionally, these courses are used to develop elementary education majors for the Pearson Foundations of Reading assessment, which is a

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requirement of majors wishing to become certified teachers in the state of North Carolina. A few of the OER utilized for these outcomes are listed below:

- Lucia Parry. "Whole Group Phonics Lesson - Parry" Youtube. 14 Feb. 2013. Video.
- Lucia Parry. "Phonics Small Group - Parry" Youtube. 14 Feb. 2013. Video.
- Mindset Teach. "Phonics" Youtube. 10 Dec. 2013. Video.
- "Four Corners Strategy" Youtube. 23 Feb. 2017. Video.
- AmericanGraduateDC. "Explicit Vocabulary Teaching Strategies" Youtube. 30 Apr. 2012. Video.
- "High 5!" Strategies to Enhance Comprehension of Expository Text." Library (EBSCO). Academic Search Complete [a9h], 31 Oct. 2010. Article/Journal.
- "Help with teaching reading comprehension: Comprehension instructional frameworks." Library (EBSCO). Academic Search Complete [a9h], 30 Apr. 2006. Article/Journal.
- Shannon Oden. "Teaching Reading Fluency and Comprehension" Youtube. 05 Jul. 2011. Video.
- "The Interactions of Vocabulary, Phonemic Awareness, Decoding, and Reading Comprehension." Library (EBSCO). Academic Search Complete [a9h], 31 Jan. 2013. Article/Journal.
- "Fluency: Bridge between decoding and reading comprehension." Library (EBSCO). Academic Search Complete [a9h], 28 Feb. 2005. Article/Journal.

The instructor takes pride in preparing teacher candidates to know how to reach all modalities of learners in their classrooms. Teacher candidates should leave READ courses understanding how to foster reading skills and comprehension for all students. Therefore, encouraging students to become proverbial learners of reading. OER used for this learning outcome are listed for reference below:

- "A Diagnostic Teaching Intervention for Classroom Teachers: Helping Struggling Readers in Early Elementary School." Library (EBSCO). Academic Search Complete [a9h], 31 Oct. 2010. Article/Journal.
- "Teaching struggling readers in elementary school classrooms: A review of classroom reading programs and principles for instruction." Library (EBSCO). Academic Search Complete [a9h], 31 Jan. 1999. Article/Journal.
- "PLCs in Action: Innovative Teaching for Struggling Grade 3-5 Readers." Library (EBSCO).
- "Supporting English-Language Learners and Struggling Readers in Content Literacy With the "Partner Reading and Content, Too" Routine." Library (EBSCO). Academic Search Complete [a9h], 31 Mar. 2010. Article/Journal.
- "REACHING STRUGGLING READERS." Library (EBSCO). Academic Search Complete [a9h], 30 Apr. 2015. Article.
- "Revisiting Key Assumptions of the Reading Level Framework." Library (EBSCO). Academic Search Complete [a9h], 31 Aug. 2012. Article/Journal.



## **Summary of OER and VR in Higher Education**

Identifying new strategies to increase engagement in the classroom can often prove to be a struggle for today's learners. Classes include students with multiple learning styles and a variety of cultures and backgrounds; therefore, it can be a challenge creating an environment where individualized learning experiences can occur. This project encourages students to engage and inform one another concerning their unique perspectives and life experiences by using OER and VR as tools to promote active engagement and student participation (Martin, 2018). The team's goal is to assist other instructors with new and innovative ways to increase student engagement through individualized learning opportunities through flexible learning.

In December 2015, the North Carolina Department of Public Instruction (DPI) criticized teacher-prep programs in the National Educational Technology Plan sharing that overall teacher candidates were not proficient in the area of utilizing technology in their classrooms. DPI went on to say that teachers should be prepared to integrate apps and technologies into their curriculum to support state standards (Will, 2016 ). In lieu of this, Education Preparation Programs are encouraged to take initiatives to embed technology into programs. This partnership assists in the preparation of teacher candidates in utilizing OER and VR into instruction. The team continues to experience an increase in student enthusiasm, engagement, and discussions in courses with OER and VR integration. The possibilities with the two resources in the classroom are endless; therefore, the team will continue to explore avenues of learning at their perspective universities. According to the team's experience thus far, these technologies are an essential factor in assisting schools to deliver quality education.



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